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The Health of the "Older Women" in Accra, Ghana: Results of the Women's Health Study of Accra

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Abstract The health of women residing in the developing countries is not limited to reproductive health conditions or infectious diseases. While these illnesses remain serious threats to a healthy life, as the population ages, the prevalence of illnesses considered to be of significance only in industrialized nations also increasingly afflicts the residents of the developing worlds. The health and well-being of the older women was evaluated in the 2003 Women's Health Study of Accra. This community based survey and clinical and laboratory examination of 1,328 women identified a significantly high prevalence of malaria and chronic, non-communicable diseases in all age groups without regard to education level or income. Hypertension, diabetes and obesity are significantly prevalent in women age 50 years and older. The prevalence of conditions which adversely affect health and quality of life, including impaired visual acuity, poor dentition, pain and limitations with mobility is significant in the women age 50 years and older. While these data are specific to Ghana, they have the potential to be generalizable to women in other urban areas in transition. As the life expectancy is increasing in developing countries, an increased awareness and treatment of chronic health conditions in the older women is critical to ensure a healthy life as they enter their golden years.

Keywords Aging · Chronic diseases · Ghana · Sub-Saharan Africa · West Africa · Women

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Introduction

The developing world is experiencing an increase in the longevity of its population and an increase in the prevalence chronic, non-communicable illnesses (Smith and Mensah 2003). It has been estimated that over the last two decades 77% of the world's new gain in elderly populations occurs in the developing countries. This increase in the age of the population has profound implications for the health care both in the present as well as in the near future.

The assessment of the health of a population is an accepted first step in establishing priorities for policy and action. In the global burden of disease studies conducted by World Health Organization, measures of morbidity and mortality by cause were derived from a combination of survey and outpatient morbidity data. Information gaps were filled with data derived from epidemiological models in the absence of full information (WHO 2002a, b).

Recent studies on the global burden of disease have shown that women bear a disproportionate share of the total burden of morbidity despite their generally longer life expectancy than men (WHO 2008; Murray and Lopez 1996). Women, who experience occupational risks in addition to the perils of reproduction in the fast-growing urban economies of low-income countries, are at exceptional risk of poor health (Murray and Lopez 1998; Avotri and Walters 1999). In Africa, most of the recent rapid population growth has been concentrated in towns and cities (UN Pop Div 2002). In many instances, health services have not kept pace with this population growth (UNICEF 1999). It is in the cities that lifestyle changes have become the most pronounced. These include changing diets, work that is more sedentary and new habits such as smoking and drinking, all of which have initiated a health transition, introducing new illness patterns to urban populations (Amoah et al. 2002).

The Women's Health Study of Accra was conducted in 2003 in Accra, Ghana. Accra was selected as the site for this study because of the high level of migration from the rural areas to the urban environment. This was a community-based assessment of the prevalence of health conditions of adult women who currently resided in the urban environment. This study included two major components, a household survey of 3,200 women and a comprehensive clinical examination of 1,328 women. The health of women aged 50 and older in comparison to the younger women who participated in the clinical component of the study is reported here.

Methods

The study population

The area chosen for this study was the administrative unit known as the Accra Metropolitan Area, the core urban area within a larger region known as Greater Accra. The metropolitan area contains 1.66 million people and 373,540 households, according to the March 2000 census of Accra (McGranahan and Songsore 1996).

To ensure that this cohort represented all women aged 18 and older in the city, an extensive program of mapping and listing of eligible households was performed prior to the household survey (HHS) interviews. The 2000 Population and Housing Census provided a full enumeration of the population of Accra on census night, 26 March 2000. In the Accra metropolitan area, there were 1,731 occupied Enumeration Areas (EA) and each contained an average of 959 people. To increase the efficiency of the sample, the EAs were stratified by socio-economic status using the master sample (Megill 2002). Household facility

indicators and education were used to stratify all EAs in Accra into four categories. Four socioeconomic status (SES) categories contained roughly equal numbers of people which were derived by dividing the SES index into quartiles. To keep the design effect small, the "take" of women was restricted to 18 women per EA. Once the 200 sample EAs had been selected with probability proportional to population size, eligible women who were usually resident in Accra aged 18 and older were listed by name and address. Over 60,000 names and addresses were collected. From this frame, study women were selected with probabilities fixed according to the SES status of the EA and the age group of the women. For the purposes of this study, the definition of the older woman was arbitrarily defined as age 50 and greater. Older women were progressively over-sampled as per previously described (Hill *et al.* 2007). From the original cohort of women completing the household survey, 1,321 women were selected in order of survey completion and then by over-sampling the women age 50 and older to participate in the comprehensive medical clinics (Duda *et al.* 2007). The additional seven women were neighbors that came to the clinic and were then included in the medical examination.

Women age 18 and older who were current residents of Accra, Ghana were eligible. Women were asked their age, including birth month and year. For women who were uncertain of their age, important events were presented to them as a reference and an estimate made for the most accurate age possible. The 39 pregnant women in this study were excluded from the obesity-linked analyses.

The clinical assessment—Comprehensive Medical and Laboratory Examination

The Comprehensive Medical and Laboratory Examination (CMLE) was performed by physicians at Korle Bu Teaching Hospital of the University of Ghana. Confidential HIV testing was provided with voluntary pre-test and post-test counseling by trained HIV health workers. Informed consent was obtained separately for the CMLE and HIV testing.

The history included select questions from the HHS for comparative purposes, as well as a review of the past medical history (PMH) and a review of systems (ROS) for specific and non-specific symptoms that occurred over the preceding four weeks. Questions regarding the family history, medication history and drug allergies were included.

A complete physical examination was performed, including HEENT, cardiovascular, pulmonary, gastrointestinal, breast, gynecologic, neurologic and musculoskeletal surveys. Anthropometric measurements were obtained on the women wearing lightweight street clothes without shoes. Weight was measured on a calibrated Salter scale to the nearest 0.1 kilogram (kg). Height was measured to the nearest 0.5 cm with the women standing upright with the head in the Frankfurt position (Norton and Olds 1996). Body mass index (BMI) was calculated as weight (kg) divided by height (meter^2). Waist circumference was measured in centimeters (cm) at the mid-point between the lower ribs and the iliac crest. Hip measurements were taken at the maximal circumference of the buttocks. The waist to hip ratio (WHR) was calculated from the waist and hip measurements.

The laboratory evaluation included a complete blood count (CBC), fasting blood glucose (FBG), fasting lipid panel, hemoglobin genotyping, HIV testing and Papanicolaou (Pap) smear.

The CBC was performed using the impedance method on the Cell Dyne 1700 Series Analyzer (Abbott Laboratories, Abbott Park, IL.) The FBG was analyzed using the enzymatic assay kit ATAC PAK Glucose Reagents and ATAC 8000 Random Access Chemistry Analyzer (Elan Diagnostics, Dublin, Ireland). The hemoglobin electrophoresis

testing was performed using cellulose acetate strips (Biosystems S.A., Barcelona, Spain) on the Fisons FEC 570 Power Pack Analyzer (Fisons, UK). These tests were performed at Korle Bu Teaching Hospital.

The lipid panel was performed using kits purchased from Randox Lab LTD (Antrim, Northern Ireland). HIV testing was performed using Determine HIV 1/2 Rapid Test (Abbott Laboratories, Abbott Park, Il.). Positive and indeterminate tests were repeated using the InstantScreen Rapid HIV 1/2 Assay (Morwell Diagnostics GmbH, Zurich, Switzerland). These tests were performed at the Noguchi Memorial Institute for Medical Research, University of Ghana, Accra, Ghana.

Statistical analysis

The data were coded and entered into the EPI6 database at the Institute for Statistics, Social and Economic Research (ISSER), University of Ghana. Statistical analyses were performed using SPSS 13.0 for Windows (SPSS, Inc., Chicago, IL.) including descriptive frequencies, univariate and multivariate logistic regression analysis, The multivariate logistic regression analysis used to assess the variables from the medical history included education, monthly income, perception of overall health, menopause status, years living at current residence, and marital status. Student t-Test and nonparametric analyses including Wilcoxan Rank Sum Test, Fisher's Exact Test (2-sided) and Chi-square analysis. The Odds Ratio (OR) with a 95% confidence interval (CI) was used to describe the strength of the association. A p-value <0.05 is a statistically significant association.

Results

Characteristics of the women

A total of 1,328 women were examined in the medical clinic, 731 (55%) under age 50 and 597 (45%) age 50–100 years, the self-reported oldest age in the study. Table 1 shows comparison of age by highest level of education attained, monthly income level, residence, religion and ethnicity. There was a statistically significant difference in education level of the two groups, with the older women more likely to have had no formal schooling (p<0.001) and to have a lower income level (OR=0.90 [0.82, 0.98], p=0.019). There was no statistical difference in area of residence, religion or ethnicity, although the trend for ethnicity revealed older women who were Ga and fewer who were Akan in comparison to the younger women.

Women age 50 and greater were significantly more likely to be married (OR=3.30 [2.92, 3.72], p<0.001) and to have lived in the same area or residence longer (OR=1.33 [1.23, 1.43], p<0.001). In a multivariate logistic regression analysis including education, monthly income, duration at residence and marital status, all variables remained significantly associated with age greater than 50 years as shown in Table 2.

Health status assessment

Women were asked questions from the standardized Short-Form 36 health assessment tool (Ware and Sherbourne 1992). Women age >50 years were statistically (p<0.001) more likely to report that they expect their health to worsen over the next year (12.0% vs. 5.1%);

Table 1 Characteristics of the women by age group

	Age			
	Age <50 years		Age ≥50 years	
	n	%	n	%
Education* (p<0.001)				
None	100	13.9	280	48.1
Primary	70	9.7	60	10.3
Middle	362	50.3	182	31.1
Secondary	126	17.5	35	6.0
Higher	62	8.6	25	4.3
Income (cedis)* (p=0.019)				
<300,000	173	30.2	150	35.0
300,000–500,000	145	25.3	122	28.5
500,000–1,000,000	195	34.1	121	28.3
>1,000,000	59	10.3	35	8.2
Area of residence				
Ablekuma	242	33.1	203	34.0
Jamestown/Central	45	6.2	43	7.2
Osu	25	3.4	39	6.5
Labadie/Teshie	182	24.9	117	19.6
Ayawaso/Nima/Maamobi	150	20.5	121	20.3
Akeshie/Achimoto	87	11.9	74	12.4
Ethnicity				
Akan	266	36.7	124	21.1
Ga	263	36.3	330	56.1
Ewe	94	13.0	74	12.6
Other	101	14.0	60	10.2
Religion				
Catholic	56	7.4	34	5.8
Protestant	197	27.2	256	34.5
Moslem	91	12.6	68	11.6
Charismatic	128	17.7	49	8.3
Pentecostal	152	21.0	83	14.1
Spiritualist	19	2.6	26	4.4
Other Christian	54	7.5	33	5.6
Traditional	2	0.3	4	0.7
None	15	2.1	18	3.1
Other	10	1.4	17	2.1

At the time of the study 9000 cedis was the equivalent of approximately 1 USD

report health worse than anybody they know (39.5% vs. 12.9%); disagree that their health is excellent (47.0% vs. 16.0%); agree that they seem to get sicker easier than others (28.0% vs. 11.2%) and feel that their health is worse this year than last (40.6% vs. 20.4%) in comparison to younger women.

Table 2 Multivariate regression analysis of demographic characteristics comparing women age 50 and greater with younger women

Characteristic	Odds ratio	95% CI	p value
Duration at residence	3.38	2.89, 3.95	<0.000
Education	0.88	0.76, 1.02	0.010
Marital status	1.37	1.20, 1.55	<0.000
Monthly income	0.78	0.72, 0.92	0.001

Symptoms of menopause

The definition of menopause used for this study was no menses for 12 months and not pregnant or lactating. Women were defined as peri-menopausal if they had no menses for less than 12 months and were not pregnant or lactating and were age 50 or greater. Menopause status was known for 1,247 women, 573 (46.0%) pre-menopausal, 606(48.6%) post-menopausal, 68 (5.4%) peri-menopausal. Menopause status for women age 50 or greater was: 89.8% post-menopausal; 3.1% pre-menopausal, and 7.1% peri-menopausal. Menopause status for women under age 50 years was: 83.4% pre-menopausal; 9.8% post-menopausal and 6.8% peri-menopausal. Age 50 years and greater was significantly associated with post-menopausal and peri-menopausal status combined ($p<0.001$).

Menopause status was not associated with known symptoms of menopause including: self identified weight gain as determined by change in clothes size, night sweats, hot flashes, mood swings, insomnia, irritability, sadness or depression. Only 86 post-menopausal women reported ever using hormone replacement therapy, 24(27.9%) of those were under age 50 and post-menopausal.

In a multivariate analysis that includes general characteristics and perceptions of health, age 50 years and greater remained statistically associated with post and peri-menopause status, education, monthly income, duration at current residence, perception of health, and marital status as shown in Table 3.

Comparison of age with past medical history self-report

In the Past Medical History section of the HHS, women were asked a series of questions regarding illnesses that had occurred or were diagnosed within the previous 12 months. Age ≥50 years significantly associated with self-reported hypertension, diabetes, arthritis, stroke, glaucoma, cataracts, asthma, depression, blindness, and

Table 3 Multivariate regression analysis of general characteristics and perceptions of health comparing women age 50 and greater with younger women

Characteristic	Odds ratio	95% CI	p value
Menopause status (post/peri)	1.38	1.24, 1.53	<0.000
Perception of health (worse)	1.85	1.61, 2.15	<0.000
Duration at residence	1.36	1.19, 1.55	<0.000
Education	0.81	0.68, 0.96	0.016
Marital status	2.73	2.62, 3.29	<0.000
Monthly income	0.76	0.67, 0.87	<0.000

pancreatitis in the univariate analysis. Table 4 lists these conditions along with the odds ratio and confidence intervals. For those conditions which were uncommon in this cohort, a wide CI is noted.

Controlling for variables that are significantly associated with age greater than 50 years, including education, perception of overall health, menopause status, duration of years living at current residence, marital status, and monthly income, women ≥50 years and older were more likely to report hypertension, diabetes, cataracts, arthritis, and depression than younger women as shown in Table 5. The variables stroke, glaucoma and pancreatitis had too few positive answers to be included in the multivariate analysis.

Overall, 646 (48.8%) of all women interviewed had experienced symptoms consistent with the local diagnosis of malaria. Malaria was the most frequently reported illness. Women > age 50 years were just as likely to have experienced an episode of malaria as women under age 50 years (49.6% vs. 48.1%, p=NS). Increasing age was also not associated with self-reported anemia, thyroid disease, hepatitis, myocardial infarction, peptic ulcer disease, urinary tract infections or cholelithiasis.

Comparison of age with review of systems reports

A detailed and extensive review of systems was taken that covered specific and non-specific symptoms that might have occurred during the preceding four weeks. Table 6 shows those symptoms which were significantly associated with age ≥50 years in a univariate analysis. Important findings include the high number of women with pain at any site, blurred vision, joint related problems and chronic back pain. Older women were more likely to wear glasses ($p<0.001$) than the younger women. All other system variables were not associated with the older age group.

These variables which were found to be statistically significantly associated with age ≥50 years were analyzed with the significant variables education, menopause status, monthly income, perception of health, duration at current residence, and marital status. The review of system variables that remained significantly associated with age ≥50 years

Table 4 Comparison of women age ≥50 with younger women and self-reported medical history in a univariate analysis

Medical history	Age				Odds ratio	95% CI	p value
	Age <50 years		Age >50 years				
	n	%	n	%			
Hypertension	57	7.8	252	42.4	8.70	6.33–11.90	<0.001
Diabetes	6	0.8	48	8.1	10.53	4.48–25.0	<0.001
Arthritis	33	4.5	138	23.2	6.37	4.27–9.52	<0.001
Stroke	0	0	12	2.0	nd	nd	<0.001
Cataracts	1	0.1	15	2.5	18.87	2.48–142.86	0.005
Glaucoma	1	0.1	13	2.2	16.39	2.12–125.00	0.007
Asthma	14	1.9	27	4.5	2.43	1.26–4.67	0.008
Depression	2	0.3	11	1.8	6.85	1.51–31.25	0.013
Blindness	3	0.4	10	1.7	4.13	1.13–15.15	0.032
Pancreatitis	1	0.1	7	1.2	8.70	1.06–71.43	0.044

Table 5 Multivariate regression analysis of self reported medical health history comparing women age 50 and greater with younger women

Medical history	Odds ratio	95% CI	p value
Hypertension	4.31	3.19, 5.81	<0.000
Diabetes	5.55	2.53, 12.20	<0.000
Arthritis	5.85	3.88, 8.77	<0.000
Cataracts	6.71	1.83, 24.39	0.004
Asthma	7.04	0.86, 2.83	0.142
Depression	7.30	1.58, 33.33	0.011
Blindness	8.33	0.78, 8.13	0.120

include: pain at any site, blurred vision, painful joints, stiff joints, chronic back pain, difficulty with ambulation, shortness of breath on exertion, loss of memory, chest pain on exertion, loss of

Table 6 Comparison of women age ≥50 years with younger women and the positive report of symptoms in a univariate analysis

Review of symptoms	Age				Odds ratio	95% CI	p value
	Age <50 years		Age >50 years				
	n	%	n	%			
Pain, anywhere	263	36.1	339	56.1	2.15	1.72–2.68	<0.001
Blurred vision	151	20.7	276	46.4	2.98	2.34–3.77	<0.001
Joint pain	143	19.6	270	45.5	3.41	2.67–4.35	<0.001
Stiff joints	72	9.9	197	33.1	4.50	3.36–6.06	<0.001
Chronic back pain	113	15.5	175	29.5	2.72	1.74–2.97	<0.001
Numbness	119	16.3	174	29.2	2.11	1.63–2.75	<0.001
Pins and needle sensations	125	17.1	170	28.6	1.93	1.49–2.51	<0.001
Palpitations	104	14.3	157	26.4	2.16	1.63–2.84	<0.001
Difficulty ambulating	19	2.6	126	21.2	10.00	6.09–16.39	<0.001
Shortness of breath with exertion	56	7.7	122	20.5	3.10	2.21–4.34	<0.001
Memory loss	49	6.7	109	18.3	3.11	2.17–4.44	<0.001
Chest pain with exertion	29	4.0	80	13.4	2.69	1.78–4.06	<0.001
Loss of teeth	21	2.9	74	12.5	4.81	2.92–7.94	<0.001
Loss of energy	18	2.5%	62	10.4	4.59	2.60–7.87	<0.001
Urinary urgency	29	4.0	56	9.4	2.51	1.58–3.98	<0.001
Hair loss	7	1.0	33	5.5	6.06	2.66–13.70	<0.001
Slow thinking	6	0.8	27	4.5	5.71	2.35–13.89	<0.001
Constipation	41	5.6	64	10.8	2.02	1.35–3.04	0.001
Muscle cramps	5	0.7	18	3.0	4.50	1.66–12.20	0.003
Muscle weakness	16	2.2	30	5.0	2.36	1.28–4.37	0.006
Dry skin	9	1.2	19	3.2	2.64	1.18–5.88	0.018
Dizziness	99	13.6	107	18.0	1.41	1.06–1.89	0.020
Trembling	2	0.3	9	1.5	5.59	1.20–25.64	0.028
Urinary frequency	29	4.0	56	9.4	1.51	1.04–2.21	0.033
Confusion	2	0.3	8	1.3	4.95	1.05–23.3	0.044

teeth, loss of energy, urinary incontinence, constipation ($p=0.010$), muscle cramps, confusion, and urinary urgency as shown in Table 7.

Health care utilization and medication usage

Women > age 50 were statistically more likely to have ever been hospitalized than younger women (68.9% vs. 51.9%, OR 2.05 [1.63–2.57], $p<0.001$). Older women were also more likely to have ever visited an out-patient clinic (94.3% vs. 88.5%, OR 1.48[1.07–2.05], $p=0.018$). Older women were also more likely to have had a surgical procedure (31.5% vs. 17.6%, OR=1.69[1.32–2.18], $p<0.001$) and a previous blood transfusion (17.7% vs. 8.2%, OR=1.63 [1.21–2.20], $p=0.001$).

Overall, only 12.6% of women ever had a previous clinical breast examination, 1.3% ever had a mammogram, and only 1.9% ever had a previous Papanicolaou (Pap) smear or other cervical cancer screening procedure. There was no significant difference between the two age groups.

Women > age 50 were more likely to currently use medications prescribed by a physician (45.8% vs. 14.6%, $p<0.001$), an herbalist (25.9% vs. 17.7%, $p=0.001$) or a traditional healer (4.1% vs. 1.1%, $p=0.002$) than younger women. Both groups were equally likely to use medications prescribed at a pharmacy (37.7% vs. 35.6%, $p=NS$).

Comparison of age with the physical examination results

The pertinent findings from the clinical examination include a significant association with age >50 years and elevated blood pressure, decreased visual acuity, obesity, and other clinical findings and are depicted in Table 8.

Table 7 Multivariate analysis and the comparison of women age ≥50 years with younger women and the positive report of symptoms in a univariate analysis

Review of symptoms	Odds ration	95% CI	p value
Pain, any location	1.73	1.34, 2.23	<0.000
Blurred Vision	1.96	1.51, 2.56	<0.000
Stiff joints	3.55	2.58, 4.88	<0.000
Joint pain	1.67	1.28, 2.18	<0.000
Chronic back pain	1.34	1.12, 1.80	.050
Difficulty ambulating	3.68	2.21, 6.10	<0.000
Shortness of breath with exertion	2.09	1.43, 3.05	<0.000
Memory loss	2.70	1.82, 4.00	<0.000
Chest pain with exertion	2.08	1.26, 3.45	0.004
Loss of teeth	3.38	2.04, 5.57	<0.000
Loss of energy	2.13	1.22, 3.72	0.008
Urinary incontinence	12.66	3.11, 50.00	<0.000
Constipation	1.75	1.15, 2.68	0.010
Muscle cramps	19.6	5.55, 66.67	<0.000
Confusion	5.24	1.18, 23.25	0.029
Urinary urgency	2.32	1.46, 3.69	<0.000

Table 8 Comparison of women age ≥50 years with younger women and the physical examination results

Physical examination	Age				Odds ratio	95% CI	p value
	Age <50 years		Age >50 years				
	n	%	n	%			
Blood pressure systolic >140 mm Hg	169	23.4	469	80.7	13.70	10.47–17.93	<0.001
Visual acuity >20/60	183	28.2	369	79.4	9.80	7.41–12.99	<0.001
Visual acuity >20/100	60	10.6	202	43.4	6.45	4.74–8.25	<0.001
Body Mass Index >30	214	29.9	229	40.8	1.17	1.09–1.27	<0.001
Waist circumference >88 cm	299	42.8	406	70.1	3.14	2.49–3.96	<0.001
Waist to hip ratio >0.8	386	55.4	451	78.8	3.00	2.34–3.86	<0.001
Abnormal findings:							
Constitutional	19	2.6	42	7.0	2.84	1.63–4.93	<0.001
Integument	53	7.3	108	18.1	2.82	1.99–4.00	<0.001
Dental	166	22.9	386	65.1	6.27	4.92–7.98	<0.001
Neck	3	0.4	18	3.0	7.55	2.21–25.74	0.001
Pulmonary	4	0.5	29	4.9	9.34	3.26–26.71	<0.001
Cardiac	3	0.4	13	2.2	5.44	1.54–19.18	0.008
Dorsalis pedal arteries	9	1.3	48	8.1	6.90	3.36–14.18	<0.001
Posterior tibial arteries	18	2.5	59	9.9	4.26	2.49–7.31	<0.001
Rectal	32	4.8	65	11.9	2.69	1.73–4.17	<0.001
Lower extremities	13	1.8	27	4.5	2.63	1.34–5.11	0.005
Gait	7	1.0	83	14.0	16.76	7.69–36.56	<0.001
Memory	30	4.4	90	16.1	4.21	2.73–6.47	<0.001
Speech pattern	3	0.4	12	2.2	5.40	1.53–19.04	0.009
Pelvic-external	36	5.3	53	9.1	1.79	1.15–2.78	0.009

Significant abnormal findings from the constitutional component included fatigue, cachexia, ill appearance and hyperkinesia. Dental abnormalities included caries and missing teeth. The abnormal speech patterns included slurred, stuttering, rapid and slow. Memory was tested by short term memory recall for five common local objects. The neck examination identified masses and abscesses. Abnormalities detected on the pulmonary examination included rales, rhonchi, inspiratory and expiratory wheezing. The cardiovascular examination identified decreased peripheral pulses suggestive of peripheral vascular disease, irregular rhythms, murmurs and carotid bruits. Lower extremity abnormalities included rubor with dependency, pitting and non-pitting edema, varicosities and thrombophlebitis.

Abnormalities of the rectal examination included masses, heme occult positive stool, prolapse, fissures, abscesses, hemorrhoids and warts. The abnormalities identified on the external pelvic examination included deformed labia, circumcision, ulcerations, vesicles, bladder prolapse, uterine prolapse, rectovaginal fistulas, rectovaginal masses, venereal warts and anal lacerations. Abnormalities of the gait assessment included difficulty getting out of a chair, wide based gait, abnormal tandem gait, and requires assistance for ambulation. While there was no significant differences between the two age groups for the examinations of the eyes, breast, abdomen or the internal pelvic examination abnormal clinical findings of those systems included cataracts, breast masses and bloody nipple discharge, and pelvic masses, bloody and infected cervical discharge and cervical lesions.

Comparison of age with laboratory results

Based on the laboratory results, women age 50 years and older were significantly more likely than younger women to have an elevated fasting blood sugar, elevated fasting serum cholesterol, and an elevated LDL as shown in Table 9. There was no association with age >50 years and results from the HDL, Pap smear, serum triglycerides, hemoglobin testing, or HIV status (Duda *et al*. 2005a, b).

Comparison of age and co-morbidities

The combination of three risk factors for cardiovascular disease—BMI >25 (includes overweight and obese women), hypertension and diabetes, were compared to each age group. Women age 50 and older were subdivided into two groups to determine the effects of advancing age and the prevalence of these risk factors.

Table 10 shows that 422/726 (58.1%) of women with a BMI >25 were hypertensive and 78/726 (10.7%) had an elevated FBG. There was a statistically significant increase in co-morbid illnesses with increasing age. 68.3% of women age 18–49 were overweight/obese without hypertension or diabetes compared to 12.3% of women age 50–64 and 8.6% of women 65 years and older ($p < 0.001$). There was a significant increase in hypertension in overweight/obese women when comparing younger women with women >50 years old ($p < 0.001$). When BMI >25, the risk of being hypertensive and/or diabetic is: age 18–49 OR 5.51 [4.3–7.1], $p < 0.001$; age 50–64 OR 3.75[2.9–4.8], $p < 0.001$; and >65 OR 2.49[1.9–3.3], $p < 0.001$.

Effect of education and income only on medical illness

There was a statistically significant difference in education level for the two age groups, as more women ≥50 years had no formal education compared to the younger women. Controlling for highest education level attained and monthly income, the most frequent health conditions reported including hypertension (OR=12.46 [9.39–16.55], $p < 0.001$), BMI >30 (OR=1.20 [1.10–1.30], $p < 0.001$), arthritis/joint pain (OR=6.54 [2.78–10.10], $p < 0.001$), pain at any site (OR=1.99 [1.57–2.52], $p < 0.001$), blurred vision (OR=2.64 [2.04–3.41], $p < 0.001$), chronic back pain (OR=2.02 [1.51–2.69], $p < 0.001$), numbness anywhere (OR=1. 85 [1.39–2.45], $p < 0.001$), pins and needle sensations (OR=1.65 [1.25–2.19], $p < 0.001$), palpitations (OR=1,89 [1.40–2.54], $p < 0.001$), difficulty ambulating (OR=7.81 [4.63–13.16], $p < 0.001$), shortness of breath with exertion (OR=2.58 [1.80–3.69], $p < 0.001$), elevated (OR=3.78 [2.31–6.18], $p < 0.001$),and hypercholesterolemia (OR=2.23 [1.62–3.08], $p < 0.001$) continued to be significantly associated with age >50 years.

Table 9 Comparison of women age ≥50 years with younger women and the laboratory tests

Test	Age				Odds ratio	95% CI	*p* value
	Age <50 years		Age >50 years				
	n	%	*n*	%			
Fasting blood glucose >6.5 mg/dl	28	3.7	80	14.0	4.19	2.65–6.62	<0.001
Fasting total cholesterol >5.17 mmole/l	94	18.8	156	31.3	1.97	1.47–2.64	<0.001
Low density lipoprotein <2.48 mmole/l	55	11.0	94	18.9	1.37	1.15–1.64	0.001

Table 10 Comparison of co-morbid illnesses by age group

Age group (years)	Total evaluated	Total BMI >25	BMI >25, hypertensive and diabetic	BMI >25 and hypertensive only	BMI >25 and diabetic only	BMI >25, no hypertension or diabetes
18–49	645	360 (55.8%)	12 (3.3%)	93 (25.9%)	9 (2.5%)	246 (68.3%)
50–64	317	227 (71.6%)	26 (11.5%)	165 (72.7%)	8 (3.5%)	28 (12.3%)
>65	219	139 (63.5%)	22 (15.8%)	104 (74.8%)	1 (0.8%)	12 (8.6%)
Overall	1,181	726 (61.5%)	60 (5.0%)	362 (30.7%)	18 (1.5%)	286 (24.2%)

Relative risks for pertinent medical conditions using Cox regression analysis on measured variables

Cox regression analysis was performed on all dependent variables that were significantly associated with age ≥50 using the univariate analysis, and were analyzed by multivariate logistic regression analysis with the independent variables age as a categorical variable with 5 year increments, menopause status, highest education level achieved, monthly income, ethnicity and religion. The relative risk of hypertension, diabetes, legal blindness (Visual acuity >20/100), abnormal gait/mobility and memory are shown in Table 11. Other data are not included as no variable that was significant using the univariate analysis was insignificant using the multivariate logistic regression analysis.

Discussion

The increase in longevity worldwide emphasizes the need to evaluate the status of the health of the aging population. Public health and medical care strategies are dependent on the prevalent type of conditions affecting the population.

Utilization of health services increases with age as illnesses become more prevalent (Leventhal *et al.* 1993). Cardiovascular disease is the leading cause of death in the developed countries and is steadily increasing in the developing world as well (AHA 2005; Roger *et al.* 2011; Bonow *et al.* 2002; WHO 2004). The prevalence of CHD morbidity has increased worldwide in part as a result of longer life expectancy and in part because of sedentary lifestyles, tobacco usage, obesity and diet. In Sub-Saharan Africa, it is estimated that prevalence of hypertension is 20 million and Women's health in Accra a major risk factor for cerebral vascular accidents (WHO AFRO 2002). An estimated 150 million people are afflicted with type 2 diabetes globally and is expected to continue to increase (King *et al.* 1998; WHO 2002b). The Women's Health and Aging Study identified chronic conditions that significantly increase with age, including visual impairment, functional disabilities, cardiopulmonary conditions, arthritis and musculoskeletal pain, and depression (Guralnik *et al.* 1995).

One caveat of performing such a study as the WHSA is that older individuals may underreport symptoms. The reporting of symptoms or conditions can be influenced by social, psychological, and cognitive factors (Kukull *et al.* 1994).

In our study, even with a difference in education level between the two groups, significant medical conditions were identified in the older women. Underreporting symptoms may also occur because of asymptomatic events, such as silent myocardial infarctions and atypical symptoms in older individuals and undiagnosed conditions because of lack of seeking health care.

Table 11 Relative risks for pertinent medical conditions using Cox regression analysis

Dependent variable	Medical conditions identified on examination												
	Hypertension		Diabetes		Blind >20/100		Poor dentition		Mobility		Cardiovascular		Memory
	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.	Odds ratio	95.0% C.I.
Age[a]	1.61*	1.54, 1.69	1.20*	1.13, 1.27	1.48*	1.42, 1.55	1.38*	1.32, 1.43	1.42*	1.31, 1.56	1.38*	1.13, 1.70	1.15*	1.08, 1.23
Menopause	1.05	0.97, 1.15	1.17***	1.05, 1.31	1.06	0.98, 1.15	0.91	0.83, 1.00	1.27*****	1.09, 1.46	0.70	0.23, 2.12	0.73	0.53, 1.01
Ethnicity	1.00	0.95, 1.05	1.03	0.96, 1.11	0.97	0.92, 1.02	1.04	0.99, 1.08	0.92	0.82, 1.02	1.20	0.97, 1.47	0.87	0.78, 0.97
Education	1.11**	1.01, 1.23	0.89	0.76, 1.04	0.95	0.86, 1.05	0.88****	0.86, 1.03	0.71******	0.56, 0.89	1.10	0.63, 1.91	0.57	0.48, 0.69
Income	1.02	0.92, 1.14	1.17	0.98, 1.39	0.90	0.80, 1.01	0.90	0.80, 0.97	0.90	0.71, 1.14	0.81	0.44, 1.50	0.85	0.70, 0.02
Religion	1.00	0.99, 1.01	1.00	0.98, 1.01	1.00	0.99, 1.01	1.00	0.99, 1.00	0.99	0.97, 1.01	1.00	0.95, 1.05	1.00	0.89, 1.01

*p<0.001; **p=0.032; ***p=0.006; ****p=0.001; *****p=0.002; ******p=0.004

[a] Age measured in 5 year increments

The results from the WHSA identified the most common major medical problems in the older women which includes malaria, hypertension, obesity, diabetes and pain. Pain of any type, but particularly joint and back pain, is among the most common symptoms reported by the older women. In this study, the term "back" also included the neck for many respondents and the description of waist pain is consistent with back pain. This was a common report for most women, some of which may be attributable to the heavy loads women carried on their heads as young women. Malaria was as equally likely to affect the older women as the younger women. This finding emphasizes the double burden of illnesses that urban women in the developing countries must bear. Neither the highest level of education attained nor the level of monthly income affected the significant relationship between medical condition identified and age.

In this cohort of 1,328 women, only 46 women—8 of whom were 50 years or older—had no history of malaria and no history of joint pain in the last 12 months, and a normal blood pressure, BMI, normal, total cholesterol and LDL. As shown in Table 6, the risk of co-morbid diseases increases significantly with age. Risk factors for cardiovascular disease, which include hypertension, obesity, hypercholesterolemia, an elevated LDL and diabetes, are very common in these older women. Of concern is that although these conditions are significantly higher in the older women, they are highly prevalent in the women under age 50 years. Hence, targeted interventions for both younger and older women to address these health issues are critical to ensure a healthy aging population. The clinical signs of peripheral vascular disease as evidenced by diminished or absent pulses in the feet and accompanying suggestive skin changes is just under 10% in the older women, another indication of the prevalence of cardiovascular diseases in this population.

Gynecologic abnormalities are common in both older and younger women. Older women had significantly more abnormal findings related to external trauma such as female genital circumcision, prolapsed pelvic organs and fistulae, while lesions clinically suggestive of cervical cancer were identified in both age groups on the internal pelvic examination. This study did not identify any cervical cancers in the screening Pap smears, an issue that is currently being addressed. Only 1.9% of all of the women in this study reported ever having being screened for cervical cancer (Duda et al. 2005a, b; Chen et al. 2005).

Impaired visual acuity was identified in most women. For those who were illiterate, shapes were used instead of letters to facilitate an accurate measurement. While older women were more likely to wear eyeglasses than younger women, few women in the study owned a pair. Dental hygiene was also a significant problem for older women as dental caries and loss of teeth become more common with age.

To summarize, as populations age in the developing countries, health issues shift to include noncommunicable illnesses such as heart disease, hypertension, diabetes, cancers and frailty. Health care services need the support of the health ministry so that services can be expanded to provide not only reproductive health care to women but also a strong focus on general health care as the population ages. This places a major burden on the health ministry as funds should not be reallocated from existing programs but rather must be expanded to cover the changing medical and social needs of the population. In addition, other government sectors must be aware of the changing paradigm in the urban environment and address the needs for ready access to transportation, Women's health in Accra food and housing. As migrations continue into the urban areas, the extended family network may not be as readily available as in the rural environments.

Conclusion

There are many priority health conditions for women who live in the developing countries. In addition to addressing issues related to poverty, sanitation, infectious diseases, malaria and other tropical diseases and reproductive health needs, as the population ages, chronic conditions that include hypertension, diabetes, pain, arthritis, poor visual acuity and poor dental hygiene play an important role in their overall health care management.

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